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Contribution of individual to collective brands*

Juan L. Nicolau and Francisco J. Mas**

Abstract

Traditionally, literature estimates the equity of a brand or its extension but it pays little attention to collective brand equity even though collective branding is increasingly used to differentiate the homogenous products of different firms or organizations. We propose an approach that estimates the incremental effect of individual brands (or the contribution of individual brands) on collective brand equity through the various stages of a consumer hierarchical buying choice process in which decisions are nested: "whether to buy", "what collective brand to buy" and "what individual brand to buy". This proposal follows the approach of the Random Utility Theory, and it is theoretically argued through the Associative Networks Theory and the cybernetic model of decision making. The empirical analysis carried out in the area of collective brands in Spanish tourism finds a three-stage hierarchical sequence, and estimates the contribution of individual brands to the equity of the collective brands of "Sun, Sea and Sand" and of "World Heritage Cities".

Keywords: collective brand equity, consumer multi-stage choice process, random parameter Logit Model.
JEL Classification: D11, M31.

Resumen

La literatura ha puesto énfasis en el análisis del valor de una marca o sus extensiones, pero se ha centrado menos en el valor de la marca colectiva, aunque su uso empresarial sea cada vez mayor con el fin de diferenciar los productos homogéneos de diferentes organizaciones. Proponemos un enfoque que estima el efecto incremental de las marcas individuales (es decir, la contribución individual de cada marca) en el valor de la marca colectiva a través de un proceso de compra jerárquica en varias etapas en el que las decisiones están anidadas: "si comprar o no", "qué marca colectiva comprar" y "qué marca individual comprar". Esta propuesta sigue el enfoque de la Teoría de la Utilidad Aleatoria, y se argumenta a través de la Teoría de Redes Asociativas y el Modelo Cibernético de Decisión. La aplicación empírica desarrollada en el área de las marcas turísticas colectivas detecta una secuencia en tres etapas, y estima la contribución de las marcas individuales en el valor de las marcas colectivas "Sol y playa" y "Ciudades Patrimonio de la Humanidad".

Palabras clave: valor de marca colectiva, proceso de elección multi-etápico, Modelo Logit con coeficientes aleatorios.

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1. Introduction

Marketing managers have long recognised that brands are valuable to their firms; and from this comes the importance of estimating their value or equity (Simon and Sullivan, 1993). Traditionally, literature estimates brand equity (e.g.: Aaker, 1996; Keller, 1998) or that of its extension (e.g.: Swait et al., 1993; Park and Srinivasan, 1994), based on different definitions of brand equity which share the view that the value of a brand to a firm is created through the brand's effect on consumers (Erdem et al., 1999).

However, previous research in this field does not consider collective brand equity; despite the fact that collective branding is now increasingly used to differentiate the homogeneous products of different firms or organizations. A collective brand is defined as a brand whose property and/or use is shared between several legally autonomous players (Sauvé, 2001). In practice, a collective brand usually belongs to an association whose members make use of it; and in most cases the collective brand is associated with other brands that belong to individual members (firms and organizations). According to Vertinsky and Zhou (2000), this collective brand strategy involves producers of the same product category agreeing to use a label as the main brand, which is then tied to a code of practice that certifies the quality standards to be achieved. Only those firms meeting the quality standards can use the collective brand, thus rewarding them for investments contributing to the brand equity (Rangnekar, 2004). Thus, on the supply side, it allows service providers to have access to a collective reputation (Malorgio et al., 2007). In fact, trade associations very often manage collective reputation to defend their members' interests with stakeholders such as regulators, industry financial analysers, employees, suppliers, and the media (Tucker, 2008).

On the demand side, a collective brand represents a quality signal solving the problem of information asymmetries (Malorgio et al., 2007). In fact, the adoption of a collective brand is a very relevant marketing and communication tool for clusters since it transmits to the consumer a characteristic common to all the products or services included in the collective brand. In any case, when a collective brand meets or exceeds consumer expectations by delivering realities that match up to the brand's promises, firms attempt to achieve collective brand authenticity by looking for additional associations linked to the collective brand to reinforce its claims, in such a way that each one incrementally adds value (Tregear and Gorton, 2005). Therefore, it is very

useful to know –from a consumer perspective- collective brand equity and the contribution of the different entities that share its use.

In order to estimate collective brand equity, and thus fill this gap in the literature, our analysis assumes that collective brand equity should come from a range of relationships or associations among brands; and in particular, from consumer impressions of the contributions of the individual brands to the attraction of the collective brand. Accordingly, we consider that collective brand equity could be better understood if it were studied through an approach that assesses the incremental effect of the individual brand through the various stages of a hierarchical choice process followed by the consumer; in which the following choices are nested (not independent): "whether to buy", "what collective brand to buy" and "what individual brand to buy". Our proposal follows the Random Utility Choice Theory (McFadden, 1986), and is theoretically argued through the Associative Networks Theory (Collins and Loftus, 1975) and the cybernetic model of decision making (Steinbruner, 1974).

In virtue of the above, the objective of this study is to estimate the contribution of individual brands to collective brand attractiveness. To this end, the methodology tests and compares a two-stage hierarchical choice process of "whether to buy" and "what individual brand to buy" with a three-stage process of "whether to buy", "what collective brand to buy" and "what individual brand to buy", using Random Coefficient Multinomial Logit Models. We also calculate individual consumer utilities of collective brands and their component brands in order to estimate the contribution of each individual brand to the collective brand equity; regressing the global utility over the individual utilities. The empirical analysis is carried out in Spain on a sample of 2,390 individuals in the field of collective brands in tourism.

In order to fulfil this objective, the remainder of the paper is arranged as follows: the second section justifies the estimation of collective brand equity through the contribution of the individual brands to the attraction of the collective brand, based on a hierarchical choice process. The third section covers the design of the investigation, describing the methodology, sample and variables used. The fourth section presents the results obtained and their discussion. Finally, the fifth section summarises the conclusions.

2. Collective brand equity

The efforts of the literature to measure brand equity initially assume conscious processes where consumers have access to the mental activity in which brand equity has its genesis (Erdem et al., 1999). In this line, authors such as Aaker (1996) and Keller (1998) use traditional knowledge and awareness measures as well as beliefs and attitudes that underlie brand image. However, recent studies (e.g.: Krishnan and Chakravarti, 1999) show that many aspects of brand equity can be derived from non-conscious mental processes that cannot readily be accessed by traditional awareness measures, which makes it necessary to study indirect measures that capture the implicit types of brand memory; memories that may be the basis of brand predispositions that influence marketplace outcomes for the brand. Therefore, it is important to understand the circumstances under which these memory traces may be activated (Erdem et al., 1999). Specifically, we extend (in Section 2.1) this non-conscious mental process approach using the Associative Network Theory (Collins and Loftus, 1975) to explain the information processing of individual and collective brands (through the interconnections between them and consumer memory) and the activation of these brands.

Another recent research thread (e.g.: Kamakura and Russell, 1993; Swait et al., 1993; Park and Srinivasan, 1994) infers brand equity from studying the transformation between a consumer's utility from a brand and choice. This thread follows the Random Utility Choice Theory (McFadden, 1981; 1986), and is based on "bounded rationality" (Simon, 1955), which holds that decision makers have limitations on their capacity for processing information (limited working memory and limited computational capabilities), which means that behaviour is shaped by the interaction between the properties of the human information-processing system and the properties of task environments (Simon, 1990). Hence, a typical consumer choice involves a set of alternatives (which can vary in size from one choice to the next), each described by some attributes (which may vary in their potential consequences); and the consumer may not have information for all the options on some attributes. This leads to the possibility of an individual using a variety of different strategies when making decisions, such as "weighted adding" and "lexicographic", which consider one brand at a time and examine each of the attributes for that option in order to choose the alternative with the highest value or the alternative with the best value on the most important attribute, respectively. Alternatively, our paper proposes (in Section 2.2) that collective brand decision strategies are of the "satisficing" type (satisfice = *satis*fy + suf*fice*), as defended by Simon (1955) where alternatives are considered sequentially, in

the order in which they occur in the choice set; and whose principal implication is that the option chosen can be a function of the order in which the options are processed (Bettman et al., 1998). Following this satisficing decision strategy, we consider that collective brand equity could be better understood by evaluating the incremental effect of individual brands through the various stages of a consumer hierarchical choice process whose choices are nested: whether to buy, what collective brand to buy and what individual brand to buy.

With regard to the above, we will now extend the following aspects: i) the Associative Network Theory (Collins and Loftus, 1975) to explain how the information on individual brands and collective brands is represented, processed and activated in memory by consumers; and ii) the Cybernetic model of decision making (Steinbruner, 1974) to explain how the consumer can follow a hierarchical choice process (such as whether to buy, what collective brand to buy, and what individual brand to buy) to reduce uncertainty and complexity in the decision task.

2.1. Associative network theory

Information processing for a collective brand: The Associative Network Theory holds that information is held in the memory through an interrelated structure of "cognitive networks" (Collins and Loftus, 1975; Quillian, 1969), in which each cognitive network has various "nodes" and "links" between different nodes. The nodes are fixed points in the memory structure that can represent any piece of information (Rummelhart, Lindsay and Norman, 1972), such as semantic, pictorial or sound meanings; thus, brand names and implicit attributes are represented as nodes in a network (e.g.: Category node= touristic destination; Brand 1 node=Costa del Sol; Brand 2 node=Costa Blanca; Attribute node: going on sun, sea and sand holidays). The links are associations and represent the routes through which the meanings are connected to each other. A link between two nodes is established when a person processes information that associates the nodes in some meaningful way (Samu, Krishnan and Smith, 1999), such as the properties of the concepts (brand names) represented. For example, two links between the touristic destination product and Costa del Sol and Costa Blanca brand nodes may indicate that these brands are members of the category. Links can have different "externalities", which are numbers indicating how essential each link is to the meaning of the concept. Furthermore, the links are not simply undifferentiated links, but must be complicated enough to represent any relation between two concepts. In this sense, links can be: superordinate and subordinate links,

disjunctive sets of links, conjunctive sets of links, and nested links or embedded to any degree of depth.

According to this theory of Associative Networks, nodes and links would be generated for collective brands in the following way: given that consumers are generally conscious that the creation of a collective brand comes from the same source as the original individual brands (head nodes), the memory nodes of the collective brand are stored in the same place (or very close) as the information on the original individual brands. Specifically, a collective brand and its individual linked brands would be represented by nested links (e.g.: two nested links with a 2-level hierarchy: i) individual brand 1 node=Costa del Sol → collective brand node="Spain: Sun, sea and sand"; and ii) individual brand 2 node=Costa Blanca → collective brand node="Spain: Sun, sea and sand").

Activation of a collective brand: After a link is formed in the memory, the link and the nodes can be "activated" (Anderson, 1983). Activation is the process by which a node is stimulated from a state of rest, thereby revealing its contents to the memory system. It can occur directly, through external stimulation such as advertising, or indirectly through the process of spreading activation from other nodes. In the case of advertising, activation of links and nodes is quick and superficial. In the case of indirect activation, if a consumer elaborates on the relationship between nodes, s/he will produce stronger memory links, which means that the longer a node is processed during elaboration the longer it releases activation through the links (Samu et al., 1999). In other words, the accessibility of a property depends on how often a person thinks about or uses a property of a concept (Collins and Loftus, 1975).

However, in the specific context of superordinate or nested connections (e.g.: collective and individual brands), there is no consensus on how they are activated. Collins and Loftus (1975) analyze these superordinate connections (by using the spreading activation theory of human semantic process of Sullivan (1966)), and conclude that the memory search to make a categorisation judgment can proceed from the instance to the category (Juola and Atkinson, 1971) as well as from both the instance and category in parallel (Collins and Loftus, 1975). In any case, from the assumption of Loftus (1973 a,b) that memory is organized according to semantic similarity, it follows that if "collective brand" is primed, activation at any type of individual brand will accumulate from many neighbouring nodes. The more properties two or more concepts have in common, the more links there are between these nodes via these properties; and the more closely related the concepts are. This means that different

brands of a collective brand will all be highly interlinked through their common properties. In these terms, semantic relatedness is based on an aggregate of the interconnections between the concepts. This is the notion of concept relatedness (or semantic similarity) for human memory, which is the theoretical basis of our proposal to estimate collective brand equity, which holds that individual brands make a contribution to collective brand equity.

2.2. Cybernetic model of decision making

The previous literature on the rational choice theory traditionally assumes that decision makers make a single-stage rational analytic decision (Bettman et al., 1998). The key assumptions are: i) decision-makers consider all the alternatives at the same time; and ii) decision-makers consider all the factors (attributes) at the same time; hence, all the factors have the same level of relevance for all the alternatives. However, according to the "satisficing" model proposed by Simon (1955), due to its limited analytical capability, the human brain does not always try to obtain a rational solution to a problem by considering all the alternatives and optimizing. Hence, when confronted with a complex problem the limited human brain "satisfices" rather optimizes (Kumar and Subramaniam, 1997). Accordingly, Steinbruner (1974) combines the notions of "satisficing" and models cognitive processes to propose the "cybernetic" model of decision making. The "cybernetic" decision maker decomposes the problem and the environment into stable subsystems. The decision maker eliminates the variety inherent in the decision problem by ignoring it and monitoring only a small set of critical variables before making the final decision through a sequential process based on some heuristics.

With regard to the superiority of this hierarchical sequential decision process (multi-stage) over the single-stage decision process, the following aspects are important: initially, single-stage rational analytic strategies are most likely to yield correct or optimal decisions by considering all the alternatives and optimizing. Therefore, the single-stage rational analytic decision strategy would be superior to the hierarchical strategy. However, the optimality of the solution using the single-stage rational analytic strategy is dependent on the amount and the quality of the information available. In cases with too many factors for consideration and if obtaining reliable and accurate information is too difficult and expensive, the decision-maker will use a hierarchical strategy to simplify the structure of the decision problem (Kumar and Subramaniam, 1997). Given that the specific case of brand choice has numerous factors for consideration and problems related with available information, a more likely situation is

that the multi-stage decision strategy is superior to the single-stage decision strategy. First, the literature proposes numerous factors from different theoretical approaches to explain brand choice (see Guadagni and Little, 1993; Jones and Landwehr, 1988; Kamakura and Russell, 1989). These factors foment a hierarchical decision making process. Second, problems with information. Consumers operate in an environment where available information is subject to the usual problems of data integrity and reliability of sources, which foments a hierarchical decision-making process. Furthermore, many consumers do not have the time to collect exhaustive information regarding brands, and they use the hierarchical strategy for their brand choice to reduce uncertainty to a certain manageable level.

To sum up, a decision made by a consumer depends on characteristics of the decision task, such as the number of factors considered to make the decision and expectations around the quality of the information available to make the decision. If a consumer faces a decision with few alternatives/determinant factors and with reliable information, the consumer faces a simple decision and s/he would use a single stage decision process. However, if the consumer faces a very complex decision with a high number of alternatives/determinant factors and with non reliable information, the consumer will try to use hierarchical decision strategies that are less formal and transparent but easier to use. Keeping the above in mind, the latter situation characterizes the brand decisions, and starting from the two-stage natural hierarchy among brand decision considered initially by Bucklin and Lattin (1991) (which distinguishes “whether to buy” and “what brand to buy”), we propose a three-stage hierarchy where “whether to buy”, “what collective brand to buy” and “what individual brand to buy” are nested and non-independent.

Specifically, according to Kumar and Subramaniam (1997) and Pan and Tse (2000), given that there are different individual brands within various collective brands, some of them are more similar to one another than others, and therefore, do not compete with each other at the same level. In consequence, the choice of an individual brand could follow a hierarchical process to reduce uncertainty and complexity in the decision task: i) consumers would first structure various individual brands into a multi-level hierarchy (collective brand); and ii) consumers would define a set of evaluation criteria for each level, keeping in mind that consumers consider only a few critical factors at each level of the hierarchy, and that consumers consider different factors at different levels of the hierarchy. In virtue of the above, we propose:

H.1: A hierarchical brand decision process is followed, where the nested choices are "whether to buy", "what collective brand to buy", and "what individual brand to buy".

According to the "bounded rationality" approach (Simon, 1955), the implication of this sequential order (hypothesis 1) is that the option chosen can be a function of the order in which the options are processed (Bettman et al., 1998). Thus, if this sequential order is found, we can consider that collective brand equity could be better understood by evaluating the incremental effect of the individual brand through the various stages of the consumers' hierarchical choice process.

3. Research design

3.1. Methodology

In this section we outline a methodology for estimating collective brand equity from a hierarchical consumer choice perspective.

First, we test hypothesis 1 by contrasting the two alternative hierarchical multi-stage consumer choice processes: i) a two-stage consumer model of the "whether to buy" and "what individual brand to buy" decisions. The choice in the first stage is between buying and not buying. Consumers who choose to buy in the first stage go on to a second stage in which they decide among different individual brands. ii) a three-stage model of "whether to buy", "what collective brand to buy" and " what individual brand to buy". The choice in the first stage is between buying and not buying. Consumers who choose to buy in the first stage go on to a second stage in which they decide among different collective brands. Consumers who choose a collective brand in the second stage go on to a third stage choice among different individual brands of the previously chosen collective brand. A random coefficient multinomial logit (RCL) estimates the earlier specified two and three-stage models. Specifically, RCL models are an alternative to the more traditional multinomial logit models due to (Train, 2003): i) their ability to deal with the unobserved heterogeneity of consumers, by assuming that the coefficients of the variables vary among consumers; and ii) their flexibility, which allows representation of different correlation patterns among alternatives.

With regard to the first point, the whole consumer sample is unlikely to have the same set of parameter values. This variability implies the need to consider unobserved heterogeneity of consumers in parameter estimations. Hence, the utility of alternative

brand i for consumer t is defined as $U_{it} = X_{it}\beta_t + \varepsilon_{it}$ where X_{it} is a vector that represents the attributes of the brand and the characteristics of consumers; β_t is the vector of coefficients of these attributes of brands and characteristics for each individual t which represent personal tastes; and ε_{it} is a random term that is iid extreme value. This specification of the RCL model allows coefficients β_t to vary over decision makers with density $g(\beta)$), which means that it differs from the traditional Logit model in which β is fixed. Thus, the non-conditional probability is the integral of $P_t(i/\beta_t)$ over all the possible values of β_t:

$$P_i = \int_{\beta_t} \frac{\exp\left\{\sum_{h=1}^{H} x_{ih}\beta_{th}\right\}}{\sum_{j=1}^{J} \exp\left\{\sum_{h=1}^{H} x_{jh}\beta_{th}\right\}} g(\beta_t \mid \theta) d\beta_t \qquad (1)$$

where J is the number of alternatives and g is the density function of β_t and θ are the parameters of this distribution (mean and variance).

With regard to the second aspect, the flexibility of the RCL model allows us to represent different correlation patterns among non-independent alternatives. This flexibility avoids the assumption of Independence from Irrelevant Alternatives (IIA). Conversely, the multinomial logit model assumes the hypothesis of IIA, which supposes the existence of identical correlation patterns and, therefore, proportional substitutions across alternatives. In fact, the RCL model does not have the restrictive substitution patterns of the Logit model, as the ratio of probabilities P_{ti}/P_{tj} depends on all the data, including the attributes of alternatives other than i and j.

Note that a priori, the first applicable model to this context would the Nested Logit Model (NL). In this regard, Eymann & Ronning (1992) and Eymann (1995) use a Nested Logit Model because it resolves the problem of the assumption of Independence from Irrelevant Alternatives (IIA) and is more suitable for the analysis of multi-choice decisions. However, the have to resort to estimate the model with the sequential technique proposed by McFadden (1981) in order to avoid computational problems arising from maximum likelihood estimations using a large database and a large number of alternatives. The maximization of the likelihood function can be difficult as it is not always fully concave, and it is also important to stress that sequential estimation results in consistent but not efficient estimators (Train, 2003:89).

These pitfalls of the NL models, the need to use a model capable of finding the heterogeneity between tourist preferences and estimating individual parameters, along with the flexibility of the RCL model that allows representation of any random utility model (McFadden & Train, 2000), lead us opt for the RCL model. According to McFadden & Train (2000), an RCL model can approximate a NL, which is appropriate for non-independent and nested choice alternatives. Following Browstone & Train (1999), the RCL model is analogous to an NL model in that it groups the alternatives into nests by including a dummy variable in the utility function which indicates which nest an alternative belongs to. The presence of a common random parameter for alternatives in the same nest allows us to obtain a co-variance matrix with elements distinct from zero outside the diagonal, obtaining a similar correlation pattern to that of an NL model.

A further interpretation can be given to this nest parameter, as it represents the attractiveness of the nest. In fact, according to Train (2003), it plays an analogous role to the inclusive value of NL models. In the context of collective brands, this coefficient indicates the utility that the consumer receives no matter which alternative individual brand s/he chooses in the nest. This parameter α_k for nest k takes the unknown information (variables) that describe collective brands, so that these variables differ over collective brands but not over alternatives within each collective brand. Thus, the utility of alternative individual brand i for consumer n is defined as:

$$U_{in} = \alpha_{kn} + \beta_{kin} + \chi_n p_i + \varepsilon_{in} \qquad (2)$$

where α_{kn} is the k-nest-specific parameter (collective brand parameter) for consumer n, β_{kin} is the alternative-specific constant (individual i-brand included in collective k-brand) for consumer n, and χ_n is the parameter of the attribute price p_i for each consumer n which represents personal sensitivity. Therefore, the equation (1) becomes:

$$P(i / p_i, \theta) = \int P(i / p_i, \alpha, \beta, \chi) g(\alpha, \beta, \chi / \theta) d\beta \qquad (3)$$

Note that $g(p_i,\alpha,\beta,\chi / \theta)$ is the distribution of the random parameter vector β in the population of all consumers, and θ are the parameters of this distribution (mean and variance). We can derive the distribution $h(\alpha,\beta,\chi / i,p_i,\theta)$ of the sensitivities of consumers selecting alternative i, by applying Bayes' rule:

$$h(\alpha, \beta, \chi / i, p_i, \theta) \cdot P(i / p_i, \theta) = P(i / p_i, \alpha, \beta, \chi) \cdot g(\alpha, \beta, \chi / \theta)$$

And re-arranging,

$$h(\alpha, \beta, \chi / i, p_t, \theta) = \frac{P(i / p_i, \alpha, \beta, \chi) g(\alpha, \beta, \chi / \theta)}{P(i / p_i, \theta)}$$

Therefore, we can obtain the collective brand parameter α_{kt} and the individual brand parameter β_{in} of consumer *n* through the expressions

$$\bar{\alpha}_n = \int \alpha \cdot h(\alpha, \beta, \chi / i, p_i, \theta) = \int \frac{\alpha \cdot P(i / p_i, \alpha, \beta, \chi) g(\alpha, \beta, \chi / \theta) d\beta}{P(i / p_i, \theta)} = \frac{\int \alpha \cdot P(i / p_i, \alpha, \beta, \chi) g(\alpha, \beta, \chi / \theta) d\beta}{\int P(i / p_i, \beta) g(\alpha, \beta, \chi / \theta) d\beta}$$

$$\bar{\beta}_n = \int \beta \cdot h(\alpha, \beta, \chi / i, p_i, \theta) = \int \frac{\beta \cdot P(i / p_i, \alpha, \beta, \chi) g(\alpha, \beta, \chi / \theta) d\beta}{P(i / p_i, \theta)} = \frac{\int \beta \cdot P(i / p_i, \alpha, \beta, \chi) g(\alpha, \beta, \chi / \theta) d\beta}{\int P(i / p_i, \beta) g(\alpha, \beta, \chi / \theta) d\beta}$$

Second, we estimate the specific contribution of each individual brand to the collective brand equity by regressing the collective brand utility on each brand utility. The final utility of an alternative depends on the image of both the collective and individual brands. Thus, the decision is influenced by the addition of the two images. The parameter α is an average value of the collective brand; if we add the parameter β the result would show the intrinsic global value that the consumer gives to the final choice (i.e. β would indicate how higher or lower the destination is than the rest of destinations within the same collective brand). However, the central question is: how is the collective brand image generated? The image of a collective brand is created by the components in it, so if we estimate the value of its individual brands we can gauge their contributions to the collective brand they belong to. That is, this analysis allows us to know the positive or negative effect of the individual brand value on the average collective brand value. Even though the utility of an alternative is formed by the addition $\alpha+\beta$, the individual brand value α exerts an effect on the collective brand value β, which we try to measure.

The contributions are obtained by estimating the following system of equations with one equation for each collective brand:

$$\alpha_{1,n} = \lambda_0 + \sum_{i=1}^{m_1} \lambda_{1i}\beta_{1in} + \mu_1$$

$$\alpha_{2,n} = \lambda_0 + \sum_{i=1}^{m_2} \lambda_{2i}\beta_{2in} + \mu_2 \qquad (4)$$

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$$\alpha_{K,n} = \lambda_0 + \sum_{i=1}^{m_K} \lambda_{Ki}\beta_{Kin} + \mu_K$$

where λ_{ki} $\forall k \in \{1,\ldots,K\}$ and $\forall i \in \{1,\ldots,m_k\}$ are the contributions of the individual brand *i* on the collective brand *k*, m_k the number of individual brands in collective *k*-brand, and μ_k is the disturbance for collective *k*-brand equation. According to Klapper et al. (1995), as the variables in the regression are estimated values, we weight them by their standard error.

3.2. Sample, data and variables

Collective and individual brands. Our paper is centred around the collective brands of a service, specifically, vacation tourism. This is because in many countries the public administrations have launched various collective brands for tourist destinations because this strategy increases quality differentiation and acts as an informative tool, therefore increasing consumers' utility (Malorgio et al., 2007). These collective brand names have the potential to alter consumer perceptions of destinations whose bundles of attributes may otherwise be very similar to competing offerings sourced form other geographic areas (Baker and Ballington, 2002). Furthermore, following Han (1989), an individual brand destination can capitalize on a pre-existing strong collective brand image (say, country reputation), on the basis that certain consumers transfer their knowledge and associations of a collective image to individual brands (e.g.: associating a country's image to specific products).

In the particular case of Spain, the individual and collective brands of tourist destinations have developed in the following way: The predominant tourism in Spain in the 60s was that of sun, sea and sand, which meant that the state authorities created

various individual destination brands (e.g.: Costa Brava, Costa del Sol, Costa Blanca and Costa de la luz, among others). Later, the 80s saw the creation of the collective sun, sea and sand brand "Spain" by the Spanish promotional body "Turespaña" (Spanish Tourism Institute), which was mass promoted[1] (mass market advertising) with the famous "Sun of Miró" as a logotype. Currently, the promotion of individual coastal brands is done by the autonomous communities (geographical regions) whereas the promotion of the sun, sea and sand collective brand has returned to the formula of detailed agreements between the autonomous communities under the umbrella of Turespaña (Eiros, 2005).

Concurrently, various Spanish cities (e.g.: Santiago de Compostela, Cáceres, Ávila, Salamanca, Cuenca, Segovia, Toledo, and Córdoba, among others) were awarded the distinction of "World Heritage City"[2] by UNESCO; but until the 90s they were only promoted as individual brands. It was in the 90s that Spanish holiday habits began to change, manifested by a tendency of tourists to look for alternatives to the sun, sea and sand type holiday (Bote, 1987; Fuentes, 1995). In this new context of a mature sun, sea and sand sector, the public authorities of the autonomous communities (geographical regions) and the cities (town halls) now follow a differentiation strategy to adapt to the needs of clients (Espinet et al., 2003), meaning that they implement the marketing of cities (Chías, 2005) through the promotion of each individual brand of the World Heritage Cities. This initiative has helped foment tourism alternatives in inland areas and this has facilitated environmental improvements, land planning, reductions in rural exodus and income generation through the diversification of the local economy. In the mid 90s, Turespaña supported these individual brands and, concretely, strengthened the rich Spanish cultural heritage through the creation of the collective brand "World Heritage Cities". In summary, the collective brands of "Spain: Sun, Sea and Sand" and "World Heritage Cities" were developed and promoted after the individual brands of coastal destinations and of individual World Heritage Cities.

Following the highlighted argument of the Associative Network Theory (Collins and Loftus, 1975), it is very likely that consumers have generated a hierarchical cognitive network of nodes and nested links to store information in the memory on the collective brands and their individual brands of tourist destinations, given that there are interconnections between these concepts (semantic similarity). Following the cybernetic model of decision making (Steinbruner, 1974), it is very likely that the chosen option is

[1] In the final quarter of the 20th century the number of tourists in Spain looking for sun, sea and sand grew by over 120%, and tourist spending has grown from 528 to 3,624 million Euros (Uriel et al., 2001).
[2] Spain is the country with the most World Heritage awards as of 2004 (Eiros, 2005).

a function of the hierarchical order of the option processing. In this sense, the contribution of the individual brands to the collective brands is reflected in the collective brand equity.

Data. To reach our proposed objectives, we use information on tourist choice behaviour obtained from the national survey "Spanish Holidaying Behaviour (III)", which was carried out by the Spanish Centre for Sociological Research. This is due to the following reasons: i) The availability of information on individual tourist destination brand choice behaviour in terms of different collective brands "Spain, Sun, Sea and Sand" and "World Heritage"; and ii) The survey is directed at a sample (over 18 years old) obtained in origin, which avoids the characteristic selection bias of destination brand collected samples, leading to a more precise analysis of tourist demand. The sample is taken by using multistage sampling, stratified by conglomerations, with proportional selection of primary units -cities- and of secondary units -censorial sections-. The information was collected through personal, at home, interviews with a structured questionnaire. The sample size is of 2,390 individuals, which represents a sample error of ±2.00% for a confidence level of 95.5%.

Apart from the choice behaviour around individual brands and the collective brands of "Spain, Sun, Sea and Sand" and "World Heritage" (what to buy), we use information (available in this survey) on the decision to go on holidays (whether to buy). This is because many decisions made by tourists are not single independent choices of separate elements, but rather, are complex multi-faceted decisions in which the choices for different elements are interrelated (Dellaert et al., 1998). Basically, the following decisions are taken prior to the trip: first, the decision whether or not to make a trip has to be made. Second, if a trip is chosen, decisions have to be taken about trip destination, type of accommodation, travel companions, travel mode for the trip, and duration of the trip; although most studies of tourist travel choice address destination choices as the key element in the travel decision-making process (Dellaert et al., 1998). Specifically, we focus on the decision to go on holidays (whether to buy) and the decisions around collective and individual destination brands (what to buy)[3] and we

[3] The inclusion of the decision of whether to buy (non-purchase and purchase outcomes) in the first stage of the choice process also allows analysis of the following aspects (Chiang, 1991): First, the non-purchase observations account for consumers who change from non-purchase to purchase positions, or vice versa, as a consequence of marketing variables, such as price. Second, only by including all possible outcomes can the tradeoffs prerequisite to choice be exploited. In choosing one outcome, each consumer implicitly takes a position relative to a personal threshold that resolves these tradeoffs. Though the outcomes of purchase and non-purchase are mutually exclusive, they differ only in their position relative to the threshold. Therefore, what constitutes a threshold is very important.

propose that they are nested and non independent decisions in the consumer's mind.

Variables. In order to make the choice models operative, we will define the variables used and identify the dependent and independent variables.

1) Dependent Variables. To represent the set of individual brands available to the tourist, we use the thirteen dummy variables for the following alternatives: four coastal individual brands (Costa Blanca, Costa Brava, Costa del Sol, and Costa de la Luz), eight World Heritage individual brands (Santiago de Compostela, Cáceres, Ávila, Salamanca, Cuenca, Segovia, Toledo, and Córdoba), and the alternative "not to go on holiday". The latter is used as the reference alternative for which the constant parameters are set to be zero.

2) Independent Variables.

Collective and individual destination specific variables. In order to represent the effect of each collective destination brand and every individual destination brand on their own utility, we form several dummy variables to capture the idiosyncratic utility for each and every one of them. These variables take a value of 1 in the utility function of their alternatives.

Individual brand prices. Price is considered by the majority of consumers to be a decisive factor in their tourist decision-making. Authors such as Eymann and Ronning (1992) and Usach (1999) consider that the correct method of reflecting the prices of a certain tourist market is to compare destination prices with those of the home market and those of competing destinations. Thus, Eymann and Ronning (1992) use purchase parity differentials between the origin and respective destinations, obtained from the corresponding consumer price indexes[4]. In line with these authors, our study measures destination prices of intra-country administrative units through consumer price index differentials among origins and destinations, which are published in the National Institute of Statistics (INE), and which represent the cost of living of each origin/destination[5].

[4] Morley (1994c) shows that the Consumer Price Index of a geographical region is a good indicator of tourist prices, by showing a high correlation between the two.

[5] Other destination price indicators used in the literature are: i) Costs at the destination in absolute quantities or in terms relative to individual tourist income. However, tourists have difficulties in knowing, a priori, all costs (e.g. goods bought at destination) and the exact cost of each component. And ii) Travel costs, as a proxy of total price, as it is one of the highest costs to the tourist (Morey et al., 1991; Dubin, 1998; Train, 1998; Riera, 2000; Siderelis & Moore, 1998; Morley, 1994a,b). However, the measurement of travel costs is not without problems. Travel costs are made up of the following three elements (Ewing,

4. Results and discussion

First, we test hypothesis 1 by contrasting the two alternative hierarchical multi-stage consumer choice processes, which implies the estimation by Bayesian procedures of two Random-Coefficient Logit Models.

The results obtained (see Table 1) show that the likelihood function calculated for nested structure 2 (1st stage: whether to buy (going on holiday), 2nd stage: what collective brand to buy (Sun, Sea and Sand vs. World Heritage), 3rd stage: what individual brand to buy) is superior to that of nested structure 1 (1st stage: whether to buy (going on holiday), 2nd stage: what individual brand to buy). This result does not reject hypothesis 1 as it shows that the optimum structure to represent the consumer decision sequence is nested structure 2, with a first stage in which individuals decide whether or not to go on holiday; a second stage in which those who decide to go on holiday choose between the Sun, Sea and Sand and World Heritage collective brands; and a third stage which decides the individual brand of the previously chosen collective brand. It supports the idea that the consumer decision process on tourist brands (what to buy) is nested, as collective brands are found to be primed, and thus activation at individual brand accumulates from neighbouring nodes. In fact, following the "bounded rationality" approach (Simon, 1955), the main implication of the sequential order found is that the option chosen is a function of the order in which the options are processed (Bettman et al., 1998).

With regard to the coefficients estimated, it is important to stress that the significance of parameter *b* indicates the average effect of the dimension analysed, and that the significance of the parameter of standard deviation SD(β) shows that the effect of this dimension is different for each consumer (which shows the existence of heterogeneity and the superiority of the RCL model over the standard Logit). The results obtained show the following:

1980): a) the effective cost of travelling, measurable by the price paid on public transport (Dellaert et al., 1997; Morley 1994a; 1994b) or in a private vehicle; whether by unit of distance (e.g., 0.144 €/km (Riera, 2000) or 0.16$/mile (Siderelis & Moore, 1998)) or by total fuel costs (Train, 1998); b) the physical and psychological effort of realising the journey, which, to date, has not been modelled given the impossibility of representing it in monetary terms and by unit of time (Ewing, 1980); and c) the opportunity costs of the time given to the journey (what an individual would earn if s/he spent the travelling time on money earning activities) whose measurement has been very limited in literature; using estimations from other fields (value of time spent travelling to work (Cesario, 1976; Edward & Dennis, 1976) -- untrustworthy for tourism (Goodwin, 1976; Ewing, 1980); the result of regressing the number of journeys in a period on travelling time, salary and cost of transport (Hof & Rosenthal, 1987); or arbitrarily fixing a value of 1/3 of salary per hour (Train, 1998)).

TABLE 1

ALTERNATIVE HIERARCHICAL CHOICE PROCESSES

	Nested Structure 1 "Whether to buy and what individual brand to buy"		**Nested Structure 2 "Whether to buy, what collective brand and what individual brand to buy"**	
Independent Variables	***b***	**SD of β**	***b***	**SD of β**
"Whether to buy": decision to go on holidays				
Prices	-0.260a	0.214b	-0.310a	0.314a
	(0.044)	(0.073)	(0.043)	(0.078)
"What collective brand to buy"				
Nest "Spain, sun, sea and sand"			0.294d	1.747a
collective brand			(0.153)	(0.527)
Nest "World Heritage"			-1.300a	0.760a
collective brand			(0.214)	(0.228)
"What individual brand to buy"				
Constant 1 "Costa Blanca"	2.057a	1.777b	0.925a	6.723ba
	(0.155)	(0.604)	(0.221)	(1.587)
Constant 2 "Costa Brava"	1.043a	0.579b	0.314a	0.208a
	(0.105)	(0.198)	(0.057)	(0.047)
Constant 3 "Costa del Sol"	0.994a	2.128c	0.044	3.516a
	(0.269)	(0.912)	(0.201)	(0.916)
Constant 4 "Costa de la Luz"	1.023a	1.311c	0.101	1.980a
	(0.163)	(0.614)	(0.168)	(0.381)
Constant 5 "Santiago de	-0.301b	0.905a	0.264a	0.236b
Compostela"	(0.110)	(0.285)	(0.063)	(0.080)
Constant 6 "Cáceres"	-0.467a	0.591b	-0.110	0.838a
	(0.136)	(0.209)	(0.128)	(0.250)
Constant 7 "Ávila"	-0.351c	1.444d	0.719a	0.445b
	(0.170)	(0.801)	(0.090)	(0.167)
Constant 8 "Salamanca"	-0.323b	0.453c	0.148	0.327b
	(0.120)	(0.193)	(0.129)	(0.114)
Constant 9 "Cuenca"	-0.356	0.300c	0.207	0.992
	(0.227)	(0.117)	(0.269)	(0.713)
Constant 10 "Segovia"	-1.012a	1.036a	-0.124	0.351d
	(0.175)	(0.235)	(0.088)	(0.186)
Constant 11 "Toledo"	-0.686a	0.616d	-0.443a	0.300b
	(0.098)	(0.329)	(0.123)	(0.099)
Constant 12 "Córdoba"	-1.288a	0.325a	-0.858a	0.356a
	(0.138)	(0.093)	(0.199)	(0.079)
Maximum Likelihood	-3012.233		-3010.232	

a=prob<0.1%; b=prob<1%; c=prob<5%; d=prob<10%.

On the first stage of the choice process ("whether to buy": decision to go on holiday), price shows a significant and negative parameter. This suggests that tourists tend not to go on holidays with higher prices; in line with Smith (1995) and Lanquar (2001). Therefore, price is a dissuasive element and tourism products are ordinary goods. Standard deviation of the coefficient of price is significant, which indicates that its effect is not homogeneous for all individuals.

Regarding the nest parameters, a positive coefficient is associated with the Sun, Sea and Sand collective brand and a negative coefficient with the World Heritage collective brand. As they represent the attractiveness of the nest, their values show the collective brand equity derived from the contribution of the individual brands contained

in each nest. These different signs might be explained by the level of maturity of each collective brand. The maturity of the World Heritage collective brand is by no means that of the Sun, Sea and Sand collective and individual brands: coastal brands were promoted in the sixties while the promotion of World Heritage cities collective and individual brands started in the mid-nineties. The different degree of maturity affects the manner in which consumers behave, as they do not know what they are going to find with World Heritage brands (at least, to lesser extent) as compared to coastal brands, since the former are not as popular.

This pattern is also manifested through the individual brand parameters. Fifty per cent of the coastal destinations (Costa Brava and Costa Blanca) show a positive utility with respect to the reference alternative "not going on holiday" (the other fifty per cent (Costa del Sol and Costa de la Luz) remains neutral). Regarding the World Heritage destinations, only two out of eight (Santiago de Compostela and Ávila) present significant and positive utilities, four (Cáceres, Salamanca, Cuenca and Segovia) are neutral and two show negative parameters (Toledo and Córdoba).

Note that the parameter of standard deviation SD(β) is significant in most of the variables, showing the existence of heterogeneity. At the same time, this fact confirms the superiority of the RCL model over the standard Logit.

Second, we estimate the specific contribution of each individual brand to the collective brand equity by regressing (Equations system 4) each destination collective brand utility on every individual destination brand utility for each consumer, i.e., the "Sun, Sea and Sand" collective brand over "Costa Blanca", "Costa Brava", "Costa del Sol" and "Costa de la Luz"; and the "World Heritage" collective brand over "Santiago de Compostela", "Cáceres", "Ávila", "Salamanca", "Cuenca", "Segovia", "Toledo" and "Córdoba" (see Table 2).

Equation 1 shows positive significant coefficients for every individual destination under the "Sun, Sea and Sand" collective brand, explaining 33.86% of variation. Furthermore, "Costa Blanca" contributes the most to this collective brand, followed by "Costa de la Luz" and "Costa Brava". At the end of the ranking is "Costa del Sol", which makes half the contribution of "Costa Blanca".

Equation 2 depicts negative significant coefficients for all the destinations under the "World Heritage" collective brand, with an ability to explain 8.47% of variation. We observe that the most favourable contributions (less negative) come from

Table 2

INDIVIDUAL BRAND CONTRIBUTION TO COLLECTIVE BRAND (STANDARD DEVIATION IN PARENTHESIS)

System of equations							
	Equation 1 Individual contribution to "Sun, sea and sand" collective brand				**Equation 2 Individual contribution to "World Heritage" collective brand**		
	Coefficients λ_{1i}	Contribution $\lambda_{1i}\beta_{1in}$	%		Coefficients λ_{2i}	Contribution $\lambda_{2i}\beta_{2in}$	%
"Costa Blanca"	0.2667[a] (0.0118)	0.0906	30.94%	"Santiago de Compostela"	-0.0569[a] (0.0138)	-0.0201	14.65%
"Costa Brava"	0.2108[a] (0.0119)	0.0716	24.47%	"Cáceres"	-0.0811[a] (0.0139)	-0.0222	16.18%
"Costa del Sol"	0.2326[a] (0.0119)	0.0577	19.72%	"Ávila"	-0.0525[a] (0.01379)	-0.0372	27.15%
"Costa de la Luz"	0.2481[a] (0.0120)	0.0728	24.87%	"Salamanca"	-0.0584[a] (0.01378)	-0.0137	9.98%
				"Cuenca"	-0.0518[a] (0.01377)	-0.0105	7.68%
				"Segovia"	-0.0487[a] (0.01374)	-0.0133	9.70%
				"Toledo"	-0.0464[a] (0.01379)	-0.0122	8.89%
				"Córdoba"	-0.0280[c] (0.01373)	-0.0079	5.77%
"Spain, sun, sea and sand" Constant	1.7283[a] (0.065)			"World Heritage" Constant	5.6230[a] (0.3011)		
Adjusted R-squared	0.3386				0.0847		

a=prob<0.1%; b=prob<1%; c=prob<5%; d=prob<10%.

"Córdoba", "Cuenca", "Toledo", "Segovia", and "Salamanca", and the least favourable from "Ávila", "Cáceres" and "Santiago de Compostela". Note that it is important to distinguish the contribution ($\theta_i\beta_i$) of a destination brand to the collective brand and the utility (b) of the individual destination brand, e.g. although the contributions of "Ávila" and "Santiago de Compostela" are negative, -0.0372 and -0.0201, respectively (Table 2), the individual utility assigned to these two destinations individually considered are positive, 0.719 and 0.264, respectively (Table 1).

5. Conclusions

The implication that collective brand equity could be better understood through an approach that assesses the incremental effect of the individual brand through various stages of a hierarchical choice process followed by the consumer (whether to buy, what collective brand to buy, and what individual brand to buy) has allowed us to analyse this phenomenon in the context of a sample of 2,390 individuals. To this end, we propose

the use of a Random Coefficient Logit Model which allows for the simultaneous modelling of these decisions (non independent and nested) and the analysis of the individual brand contribution to the collective brand. The empirical analysis carried out on the sample reaches the following conclusions:

The joint modelization reveals the nested and non-independent character of the consumer decisions of whether to buy and what to buy (both collective and individual brands), and also reveals a multi-stage nature of the decision making process, on account of the fact that consumers would first structure various brands into a multi-level hierarchy. The optimum structure which best represents the consumer decision sequence is that with a first stage in which consumers decide whether to buy (whether or not to go on holiday); a second stage in which those who decide to buy (go on holiday) choose between the Sun, Sea and Sand and World Heritage collective brands and a third stage which decides the individual brand of the previously selected collective brand. Therefore, it seems that, as collective brands are found to be primed, activation at individual brand accumulates from neighbouring nodes, which is explained by the "bounded rationality" perspective (Simon, 1955), insofar as the main implication of the sequential order shown is that the option chosen is a function of the order in which the options are processed (Bettman et al., 1998).

In terms of the estimation of the idiosyncratic utility of each collective and individual brand for each consumer and the posterior regression of the former on the latter, we have been able to evaluate the contribution of each individual brand to the collective brand it belongs to.

As implications for management, it can be mentioned that knowledge of the nested hierarchical choice process (whether to buy, what collective brand to buy and what individual brand to buy) has interesting implications for managers and policy makers in order to assess the collective brand equity and the contribution of the individual brands to the collective brand. First, this hierarchical process allows managers of trade associations and policy makers of geographical areas to not only know the value of different collective brands competing in a market but also, according to the contribution of the individual brand to the collective brand equity, the manager of the individual brand can decide whether to continue with the collective brand strategy or whether to abandon it in favour of independent promotion of the individual brand. Thus, if an individual brand makes a large contribution to the value of a collective brand, its manager may decide to promote it in its own right without the need to stay under the umbrella of the collective brand; and as a result, avoid the main risk of collective

strategies: that failure or quality defects in any of the individual brands could affect the image of the collective brand and hence the image of all the individual brands concerned (Rangnekar, 2004).

Second, the hierarchical nested choice process analysed in this paper allows the policy maker to assess, through the identification of individual brands' contribution to the collective brand, the extent to which each and every individual brand is favouring the objective of authenticity of the collective brand.

And third, the technique employed to carry out the analysis allows for the use of individual consumer measures. This is even more important if we consider that the current trend is to look at the more active role of the consumer in the creation of brand meaning by putting the consumer into the role of the co-producer as they create brands in concert with communities. Consumers are no longer passive consumers and they are actively co-creators of brand images. Since we are basing our analysis on the fact that the meaning of a brand is first individually determined according to their sensory experiences, cognitive operations, beliefs and emotions, and then they will socialize and will place their ideas about the brand into social discourse, it is crucial for brand managers to recognize the way individuals form their brand meanings.

Among the limitations of this study are the following: i) its static character, as it is only based on cross-section consumer data. Alternatively, collective brand equity may be inferred from studying consumer switching patterns over time. Specifically, the empirical application is based on the main annual holiday of an individual, so if we were to carry out an analysis of all holidays taken (main holiday, weekend trips etc.) in a year or over various years with panel data, it would allow us a better understanding of the determinants of the choice, and the accuracy of sensitivities would be considerably improved; ii) the field of study is Spain and it would be better if the results were reinforced by applications on other geographical areas in order to be able to generalise the conclusions.

For further research there remains the analysis of the factors that determine the consumer's utility; i.e., knowing the utilities -consumer by consumer-, we can observe the effect of specific marketing variables on these utilities. Therefore, we would be able to see the brand-related dimensions that can be manipulated by brand managers in order to have a positive influence on their brand reputation.

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